US009636679B2

(12) **United States Patent**
Fournier et al.

(10) **Patent No.: US 9,636,679 B2**
(45) **Date of Patent: May 2, 2017**

(54) **CAP FOR SEALING A CONTAINER**

(75) Inventors: **Laurent Fournier**, Versailles (FR); **Gilles Venturi**, Magny-les-Hameaux (FR)

(73) Assignee: **BIO-RAD INNOVATIONS**, Marnes la Coquette (FR)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 383 days.

(21) Appl. No.: **13/996,447**

(22) PCT Filed: **Dec. 20, 2011**

(86) PCT No.: **PCT/EP2011/073460**

§ 371 (c)(1),
(2), (4) Date: **Oct. 11, 2013**

(87) PCT Pub. No.: **WO2012/084989**

PCT Pub. Date: **Jun. 28, 2012**

(65) **Prior Publication Data**

US 2014/0041758 A1 Feb. 13, 2014

Related U.S. Application Data

(60) Provisional application No. 61/452,426, filed on Mar. 14, 2011.

(30) **Foreign Application Priority Data**

Dec. 21, 2010 (FR) 10 60947

(51) **Int. Cl.**
B01L 3/00 (2006.01)
B65D 47/20 (2006.01)

(52) **U.S. Cl.**
CPC ***B01L 3/523*** (2013.01); ***B01L 3/50825*** (2013.01); ***B65D 47/2018*** (2013.01); *B01L 2300/044* (2013.01)

(58) **Field of Classification Search**
CPC B01L 3/523; B01L 3/50825; B01L 2300/044; B65D 47/2018
(Continued)

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,515,752 A * 5/1985 Miramanda 422/568
5,342,315 A * 8/1994 Rowe A61B 17/3462 604/167.06
(Continued)

FOREIGN PATENT DOCUMENTS

EP 0 794 129 A1 9/1997
WO WO 90/09330 A1 8/1990
WO WO 92/20449 A1 11/1992

OTHER PUBLICATIONS

International Search Report and Written Opinion for corresponding International Application No. PCT/EP2011/073460, mailed on Apr. 5, 2012, 11 pages.

Primary Examiner — Mark A Laurenzi
Assistant Examiner — James Hakomaki
(74) *Attorney, Agent, or Firm* — Bookoff McAndrews, PLLC

(57) **ABSTRACT**

The present invention relates to a cap comprising a body, an opening passing through the cap and adapted in turn to be passed through by at least one product transfer member, and a membrane which, at rest, covers the opening. The membrane has a main portion that extends through the opening and defines two inclined faces, each inclined face having a distal edge. The two inclined faces form a dihedron when the membrane is at rest, the distal edges of the two inclined faces coming together at the apex of the dihedron. The cap comprises at least two flaps that extend through the opening, above the membrane, the two inclined faces of the membrane being respectively covered by two flaps, each flap
(Continued)